Food begets stem cells?

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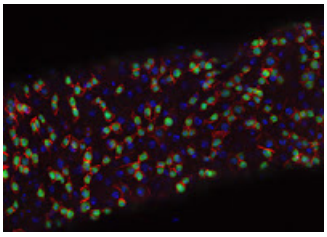


Drosophila intestinal stem cells (ISCs) respond to nutrient availabilityImage: Courtesy of Dr. Lei Wang, Salk Institute for Biological Studies

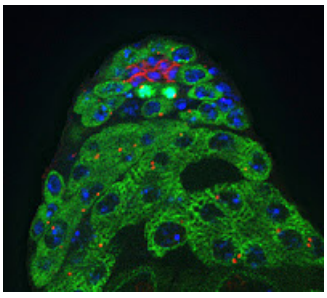
Researchers at the Salk Institute for Biological Studies have found an intriguing connection between stem cell behavior and food. The more food, the more stem cells, and those stem cells divide more vigorously.

The researchers did their work in flies, which provide a ready laboratory for studying tissue stem cells in their natural environment. Flies have a pool of stem cells in the testes and in the intestine that are easy to monitor under different conditions and that mimic similar cells in our bone marrow, liver or muscles in their capacity to rebuild tissue.

What they found is that in flies fed a poor diet, the stem cell pool in the testes and intestines dwindled and those remaining cells divided sluggishly. Improving the flies' diets rebuilt the stem cell pool. It appears that the protein insulin, which is present in the blood after a meal, is what signals stem cells about the presence or absence of food. The findings are published in the Nov. 4, 2010, online edition of the journal *Current Biology*.

In a press release, Salk writes:

> "Tissues that are maintained by stem cells respond to adverse environmental conditions by reducing the overall number of stem cells, as well as the activity of those stem cells, but maintain them in such a state that they can respond quickly and effectively once the nutritional conditions become more favorable," says Leanne Jones , Ph.D., assistant professor in the Laboratory of Genetics, who led the study.



Symmetric division of male germline stem cells (GSCs) in a *Drosophila* testisImage: Courtesy of Dr. Catherine McLeod, Salk Institutefor Biological Studies

Jones has a New Faculty Award from CIRM, although this study is not part of her grant. Salk went on to write:

> Jones and her team think it likely that the link between insulin signaling and stem cell response will turn out to be important not only for nutrient deprivation but also for other situations where a body's metabolism might be altered. "One may think of how tissue homeostasis is modified in a situation when the body cannot accurately monitor or utilize available nutrients-for instance, in case of a person who is diabetic," says Jones.
> They also hint that if the presence or absence of food can alter stem cell behavior, perhaps dramatic changes in diet could be incorporated into therapies.

Following on the heals of Halloween, here's hoping chocolate turns out to be a food that brings out the best in stem cells.

A.A.

Tags: Jones, Salk Institute, New Faculty

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